

IN THE CLAIMS:

Please amend the claims as follows.

1. (Currently Amended)     A ~~wireless VLAN construction method~~ of processing and transmitting packets over ~~[[in]]~~ a wireless VLAN system in which a ~~LAN backbone line wired with network devices is provided with an administrative computer and at least one wireless terminal~~ [[s]] are linked each other enabled to exchange packets with wired side via ~~[[a]]~~ at least one wireless interconnecting device, wherein comprising:  
storing a first reference table regarding administrative information including a VLAN identifier, an IP address, and a subnet mask, associated with a MAC address of the wireless terminal, in a memory of the administrative computer;  
~~in said wireless interconnecting device, a VLAN group is assigned to each of the wireless terminals belonging to the wireless interconnecting device based upon a MAC address of each of the wireless terminals, and~~ storing a second reference table regarding the administrative information in a memory of the wireless interconnecting device on the wireless terminals is stored, and;  
~~in~~ under control of the wireless interconnecting device, judging whether a received packet is tagged or untagged is judged includes a tag, and;  
in a case where the received packet is judged to ~~be tagged~~ include the tag,  
transmitting the packet, wherein the tag is removed from the packet before transmitting the packet is transmitted with a tag removed  
when the packet is ~~unicast and needs to be~~ transmitted to a wireless

~~terminal belonging which belongs to the wireless interconnecting device depending on the second reference table, while the packet is transferred when the packet is broadcast, and transmitted with the tag removed when the packet is broadcast and needs to be transmitted to a wireless terminal belonging to the wireless interconnecting device, and;[[,]]~~

in a case where the received packet is judged not to be untagged include the tag in the judgment whether the received packet is tagged or untagged, judging whether a source MAC address of the received packet exists on the second reference table,

in a case where the source MAC address is judged not to exist on the second reference table, sending the source MAC address to the administrative computer to update the administrative information on the first reference table, receiving the updated administrative information from the administrative computer, and updating the second reference table based on the updated administrative information,

attaching a tag including the VLAN identifier to the packet based on the administrative information on the second reference table,

and

transmitting the tagged packet when the untagged packet is unicast,  
~~a corresponding VLAN identifier is obtained from said administrative information based upon a destination MAC~~

~~address of the packet and the packet is transferred with the VLAN identifier attached thereto, while, when the untagged packet is broadcast, a corresponding VLAN identifier is obtained from said administrative information based upon a destination IP address of the packet and the packet is transferred with the VLAN identifier attached thereto, and thereby the wireless VLAN is realized.~~

2. (Cancelled)

3. (Currently Amended)     ~~A VLAN construction~~ The method in a wireless LAN system according to claim 1[[2]], wherein when the received packet is tagged and broadcast, whether or not the packet needs to be transmitted to the wireless terminal belonging to the wireless interconnecting device is judged according to a judgment whether or not a wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address of the packet belongs exists in said administrative information, and, when the wireless terminal is judged to exist in said administrative information, the packet is judged to be transmitted to the wireless terminal belonging to the wireless interconnecting device.

4. (Currently Amended)     ~~A VLAN construction~~ The method in a wireless LAN system according to claim 3, wherein in the judgment whether or not the wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address of the packet belongs exists in said administrative information, when the wireless terminal is judged not to exist in said administrative

information, a VLAN identifier is obtained from the packet to judge whether or not the VLAN identifier exists in said administrative information, and, when the VLAN identifier is judged to exist in said administrative information, the packet is judged to be transmitted to the wireless terminal belonging to the wireless interconnecting device.

5. (Currently Amended) ~~A VLAN construction~~ The method in a wireless LAN system according to claim 4, wherein in a case where the received packet is the untagged packet and unicast, transferring of the packet to which the VLAN identifier obtained based upon the destination MAC address of the packet is attached is executed when whether or not the destination MAC address of the received packet exists in said administrative information is judged and the destination MAC address is judged not to exist in said administrative information, the acquisition of the VLAN identifier from said administrative information based upon the destination MAC address being executed by obtaining the source MAC address from the received packet and then obtaining the VLAN identifier corresponding to the source MAC address from said administrative information.

6. (Currently Amended) ~~A VLAN construction~~ The method in a wireless LAN system according to claim 5, wherein in a case where the received packet is the untagged packet and broadcast, transferring of the packet to which the VLAN identifier obtained based upon the destination IP address of the packet is attached is executed when whether or not a wireless terminal belonging to the same subnetwork as the subnetwork to which said destination IP address belongs exists

in said administrative information is judged and the wireless terminal is judged to exist in said administrative information, by obtaining the VLAN identifier of the wireless terminal from said administrative information and attaching the obtained VLAN identifier to the untagged packet.

7. (Currently Amended) ~~A VLAN construction~~ The method in a wireless LAN system according to claim 6, wherein in a case where the received packet is the untagged packet and broadcast, transferring of the packet to which the VLAN identifier obtained based upon the destination IP address of the packet is attached is executed when a wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address belongs is judged not to exist in said administrative information, by obtaining the source MAC address from the untagged packet and then obtaining the VLAN identifier corresponding to the source MAC address from said administrative information and attaching the obtained VLAN identifier to the untagged packet.

8-14. (Cancelled)

15. (Currently Amended) ~~A recording medium on which recorded is a computer-readable VLAN packet processing program for a wireless interconnecting device to be executed therein for constructing processing and transmitting packets over a wireless VLAN in a wireless LAN system in which a LAN backbone line wired with network devices is provided with an administrative computer and at least one wireless terminal[[s]] are linked each other enabled to exchange packets with wired side via said at least one wireless interconnecting~~

device, ~~wherein comprising:~~

a computer-readable VLAN packet processing program executable under control  
of the wireless interconnecting device for:

~~the VLAN packet processing program enables said wireless interconnecting device~~  
~~to assign a VLAN group to each of the wireless terminals belonging to said~~  
~~wireless interconnecting device based upon a MAC address of each of the~~  
~~wireless terminals, and causes said wireless interconnecting device to~~  
~~storing[[e]] a reference table regarding administrative information~~  
~~including a VLAN identifier, an IP address, and a subnet mask, associated~~  
~~with a MAC address of the wireless terminal, in a memory of the wireless~~  
~~interconnecting device on the wireless terminals as a reference table, and~~  
~~causes said wireless interconnecting device to perform the following VLAN packet~~  
~~processing steps:~~

judging whether a received packet is tagged or untagged is judged includes a tag,  
and,

in a case where the receive packet is judged to be tagged include the tag,  
transmitting the packet, wherein the tag is removed from the packet  
before transmitting the packet is transmitted with a tag removed  
when the packet is unicast and needs to be transmitted to a wireless  
terminal belonging which belongs to the wireless interconnecting  
device, ~~while the packet is transferred when the packet is broadcast,~~  
~~and transmitted with the tag removed when the packet is broadcast~~  
~~and needs to be transmitted to a wireless terminal belonging to the~~

~~wireless interconnecting device, and,~~

in a case where the received packet is judged not to be tagged include the tag in the judgment whether the received packet is tagged or  
untagged, judging whether a source MAC address of the received  
packet exists on the reference table,

in a case where the source MAC address is judged not to exist on the  
reference table, sending the source MAC address to the  
administrative computer to update administrative  
information stored in the administrative computer, receiving  
the updated administrative information from the  
administrative computer, and updating the reference table  
based on the received administrative information,

attaching a tag including the VLAN identifier to the packet based on  
the administrative information on the reference table, and

transmitting the tagged packet when the untagged packet is unicast,  
~~a corresponding VLAN identifier is obtained from said~~  
~~administrative information based upon a destination MAC~~  
~~address of the packet and the packet is transferred with the~~  
~~VLAN identifier attached thereto, while, when the untagged~~  
~~packet is broadcast, a corresponding VLAN identifier is~~  
~~obtained from said administrative information based upon a~~  
~~destination IP address of the packet and the packet is~~  
~~transferred with the VLAN identifier attached thereto.~~

16. (Cancelled)

17. (Currently Amended)    ~~A-The~~ recording medium according to claim ~~15~~[[16]] ~~on which a computer readable VLAN packet processing program for a wireless interconnecting device is recorded~~, wherein the VLAN packet processing program causes said wireless interconnecting device to perform the following steps:

when the received packet is tagged and broadcast, whether or not the packet needs to be transmitted to the wireless terminal belonging to the wireless interconnecting device is judged according to a judgment whether or not a wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address of the packet belongs exists in said administrative information, and, when the wireless terminal is judged to exist in said administrative information, the packet is judged to be transmitted to the wireless terminal belonging to the wireless interconnecting device.

18. (Currently Amended)    ~~A-The~~ recording medium according to claim ~~17~~~~on which a computer readable VLAN packet processing program for a wireless interconnecting device is recorded~~, wherein the VLAN packet processing program causes said wireless interconnecting device to execute the following steps:

in the judgment whether or not the wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address of the packet belongs exists in said administrative information, when the wireless terminal is judged not to exist in said administrative information, a VLAN



identifier is obtained from the packet to judge whether or not the VLAN identifier exists in said administrative information, and, when the VLAN identifier is judged to exist in said administrative information, the packet is judged to be transmitted to the wireless terminal belonging to the wireless interconnecting device.

19. (Currently Amended) ~~A~~The recording medium according to claim 18 ~~on which a computer-readable VLAN packet processing program for a wireless interconnecting device is recorded~~, wherein the VLAN packet processing program causes said wireless interconnecting device to execute the following steps:

in a case where the received packet is the untagged packet and unicast, transferring of the packet to which the VLAN identifier obtained based upon the destination MAC address of the packet is attached is executed when whether or not the destination MAC address of the received packet exists in said administrative information is judged and the destination MAC address is judged not to exist in said administrative information, the acquisition of the VLAN identifier from said administrative information based upon the destination MAC address being executed by obtaining the source MAC address from the received packet and then obtaining the VLAN identifier corresponding to the source MAC address from the administrative information.

20. (Currently Amended) A recording medium according to claim 19 on which a computer-readable VLAN packet processing program for a wireless

interconnecting device is recorded, wherein the VLAN packet processing program causes said wireless interconnecting device to execute the following steps:

in a case where the received packet is the untagged packet and broadcast, transferring of the packet to which the VLAN identifier obtained based upon the destination IP address of the packet is attached is executed when whether or not a wireless terminal belonging to the same subnetwork as the subnetwork to which said destination IP address belongs exists in said administrative information is judged and the wireless terminal is judged to exist in said administrative information, by obtaining the VLAN identifier of the wireless terminal from said administrative information and attaching the obtained VLAN identifier to the untagged packet.

21. (Currently Amended) ~~A~~The recording medium according to claim 20 ~~on which a computer readable VLAN packet processing program for a wireless interconnecting device is recorded~~, wherein the VLAN packet processing program causes said wireless interconnecting device to execute the following steps:

in a case where the received packet is the untagged packet and broadcast, transferring of the packet to which the VLAN identifier obtained based upon the destination IP address of the packet is attached is executed when a wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address belongs is judged not to exist in said administrative information, by obtaining the source MAC address from the untagged packet and then obtaining the VLAN identifier corresponding to the source MAC address from said administrative information and

attaching the obtained VLAN identifier to the untagged packet.

22. (Currently Amended) A wireless interconnecting device for connecting at least one wireless terminal having VLAN function in a wireless VLAN system in which a LAN backbone line wired with network devices is provided with an administrative computer is resident wireless terminals enabled to exchange packets with wired side via said wireless interconnecting device, wherein the device comprising:
- a memory for storing a reference table regarding administrative information including a VLAN identifier, an IP address, and a subnet mask, associated with the MAC address of the wireless terminal;
- said wireless interconnecting device is enabled to assign a VLAN group to each of the wireless terminals belonging thereto based on a MAC address of each of the wireless terminals and to store administrative information of the wireless terminals, and
- means for said wireless interconnecting device judging[[es]] whether a received packet is tagged or untagged includes a tag, and,
- means for, in a case where the packet is judged to be tagged include the tag, transmitting[[s]] the packet, wherein the tag is removed from the packet before transmitting the packet with a tag removed when the packet is unicast and needs to be transmitted to a wireless terminal belonging which belongs to the wireless interconnecting device depending on the reference table, while transferring the packet when the packet is broadcast, and transmitting the packet with the tag removed when the packet is broadcast and needs to be transmitted to a wireless terminal belonging to the wireless

~~interconnecting device, and,~~

means for, in a case where the received packet is judged not to ~~be untagged~~ include  
the tag in the judgment whether the received packet is tagged or untagged,  
judging whether a source MAC address of the received packet exists on the  
second reference table, wherein in a case where the source MAC address is  
judged not to exist on the second reference table, the means sends the  
source MAC address to the administrative computer to update the  
administrative information, receives the updated administrative  
information from the administrative computer, and updates the reference  
table based on the received administrative information,  
attaching a tag including the VLAN identifier to the packet based on the  
administrative information on the second reference table, and  
transmitting the tagged packet~~when the untagged packet is unicast, obtains~~  
~~a corresponding VLAN identifier from said administrative~~  
~~information based upon a destination MAC address of the packet~~  
~~and transfers the packet with the VLAN identifier attached thereto,~~  
~~while, when the untagged packet is broadcast, obtaining a~~  
~~corresponding VLAN identifier from said administrative~~  
~~information based upon a destination IP address of the packet and~~  
~~transferring the packet with the VLAN identifier attached thereto.~~

23. (Cancelled)

24. (Currently Amended) A—~~The~~ wireless interconnecting device ~~having VLAN function~~—according to claim 22[[3]], wherein when the received packet is tagged and broadcast, the wireless interconnecting device judges whether or not the packet needs to be transmitted to the wireless terminal belonging to the wireless interconnecting device according to a judgment whether or not a wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address of the packet belongs exists in said administrative information, and, when the wireless terminal is judged to exist in said administrative information, the wireless interconnecting device judges the packet to be transmitted to the wireless terminal belonging to the wireless interconnecting device.

25. (Currently Amended) A—~~The~~ wireless interconnecting device ~~having VLAN function~~—according to claim 24, wherein in the judgment whether or not the wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address of the packet belongs exists in said administrative information, when the wireless terminal is judged not to exist in said administrative information, the wireless interconnecting device obtains a VLAN identifier from the packet to judge whether or not the VLAN identifier exists in said administrative information, and, when the VLAN identifier is judged to exist in said administrative information, the wireless interconnecting device judges the packet to be transmitted to the wireless terminal belonging to the wireless interconnecting device.

26. (Currently Amended) ~~A—The~~ wireless interconnecting device ~~having VLAN function~~ according to claim 25, wherein in a case where the received packet is the untagged packet and unicast, transferring of the packet to which the VLAN identifier obtained based upon the destination MAC address of the packet is attached is executed when whether or not the destination MAC address of the received packet exists in said administrative information is judged and the destination MAC address is judged not to exist in said administrative information, the acquisition of the VLAN identifier from said administrative information based upon the destination MAC address being executed by obtaining the source MAC address from the received packet and then obtaining the VLAN identifier corresponding to the source MAC address from said administrative information.

27. (Currently Amended) ~~A—The~~ wireless interconnecting device ~~having VLAN function~~ according to claim 26, wherein in a case where the received packet is the untagged packet and broadcast, transferring of the packet to which the VLAN identifier obtained based upon the destination IP address of the packet is attached is executed when whether or not a wireless terminal belonging to the same subnetwork as the subnetwork to which said destination IP address belongs exists in said administrative information is judged and the wireless terminal is judged to exist in said administrative information, by obtaining the VLAN identifier of the wireless terminal from said administrative information and attaching the obtained VLAN identifier to the untagged packet.

28. (Currently Amended) ~~A~~ The wireless interconnecting device ~~having VLAN function~~ according to claim 27, wherein in a case where the received packet is the untagged packet and broadcast, transferring of the packet to which the VLAN identifier obtained based upon the destination IP address of the packet is attached is executed when a wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address belongs is judged not to exist in said administrative information, by obtaining the source MAC address from the untagged packet and then obtaining the VLAN identifier corresponding to the source MAC address from said administrative information and attaching the obtained VLAN identifier to the untagged packet.

29. (Currently Amended) A wireless VLAN system comprising:  
a plurality of wireless interconnecting devices; ~~in which a LAN backbone line wired with network devices is provided with~~  
an administrative computer configured to be linked to the wireless interconnecting device, wherein the administrative computer comprises a database storing records for the plurality of wireless terminals, each of the records including a MAC address, a VLAN identifier, an IP address, a subnet mask, and a device identifier; and  
a plurality of wireless terminals configured to be linked to ~~enabled to exchange packets with wired side via said one of the plurality of wireless interconnecting devices,~~ wherein each of the plurality of wireless terminals stores a reference table regarding administrative information including a VLAN identifier, an IP address, and a subnet mask, associated with the

MAC address thereof,

wherein ~~said a first~~ wireless interconnecting device ~~is the wireless interconnecting device having the VLAN function according to claim 22 judges whether a~~ packet received from a first wireless terminal includes a tag, and,

in a case where the packet is judged to include the tag, the first wireless interconnecting device transmits the packet, wherein the tag is removed from the packet before transmitting the packet when the packet is transmitted to at least one wireless terminal which belongs to the first wireless interconnecting device depending on the reference table,

in a case where the received packet is judged not to include the tag, the first wireless interconnecting device judges whether a source MAC address included in the received packet exists on the reference table, wherein in a case where the source MAC address is judged not to

exist on the reference table, the first wireless interconnecting device sends a packet including the source MAC address to the administrative computer to update a corresponding record in the database, receives the updated record from the administrative computer, and updates the reference table based on the updated record,

attaches a tag including the VLAN identifier to the packet based on the administrative information on the reference table, and transmits the tagged packet, and



wherein, in response to the packet sent from the first wireless interconnecting devices, the administrative computer obtains the source MAC address from the packet, compares a device identifier of the one of the plurality of wireless interconnecting device with a device identifier of the wireless interconnecting, based on the comparison result, updates the record in the database associated with the source MAC address, and sends a request for updating the reference table to a second wireless interconnecting device to which the first wireless terminal belonged while sends a request for updating the reference table to the first wireless interconnecting device.

30. (Cancelled)

31. (Currently Amended)    A ~~The~~ wireless VLAN system ~~comprising a wireless interconnecting device, in which a LAN backbone line wired with network devices is provided with wireless terminals enabled to exchange packets with wired side via said wireless interconnecting device, wherein said wireless interconnecting device is the wireless interconnecting device having the VLAN function according to claim 29[[4]],~~ wherein when the received packet is tagged and broadcast, the wireless interconnecting device judges whether or not the packet needs to be transmitted to the wireless terminal belonging to the wireless interconnecting device according to a judgment whether or not a wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address of the packet belongs exists in said administrative information, and, when the wireless terminal is judged to exist in said administrative information, the wireless

interconnecting device judges the packet to be transmitted to the wireless terminal belonging to the wireless interconnecting device.

32. (Currently Amended) A ~~The~~ wireless VLAN system ~~comprising a wireless interconnecting device, in which a LAN backbone line wired with network devices is provided with wireless terminals enabled to exchange packets with wired side via said wireless interconnecting device, wherein said wireless interconnecting device is the wireless interconnecting device having the VLAN function according to claim 31[[25]], wherein in the judgment whether or not the wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address of the packet belongs exists in said administrative information, when the wireless terminal is judged not to exist in said administrative information, the wireless interconnecting device obtains a VLAN identifier from the packet to judge whether or not the VLAN identifier exists in said administrative information, and, when the VLAN identifier is judged to exist in said administrative information, the wireless interconnecting device judges the packet to be transmitted to the wireless terminal belonging to the wireless interconnecting device.~~

33. (Currently Amended) A ~~The~~ wireless VLAN system ~~comprising a wireless interconnecting device, in which a LAN backbone line wired with network devices is provided with wireless terminals enabled to exchange packets with wired side via said wireless interconnecting device, wherein said wireless interconnecting device is the wireless interconnecting device having the VLAN function according to claim 32[[26]], wherein in a case where the received packet is the untagged packet~~

and unicast, transferring of the packet to which the VLAN identifier obtained based upon the destination MAC address of the packet is attached is executed when whether or not the destination MAC address of the received packet exists in said administrative information is judged and the destination MAC address is judged not to exist in said administrative information, the acquisition of the VLAN identifier from said administrative information based upon the destination MAC address being executed by obtaining the source MAC address from the received packet and then obtaining the VLAN identifier corresponding to the source MAC address from said administrative information.

34. (Currently Amended) ~~A—The wireless VLAN system comprising a wireless interconnecting device, in which a LAN backbone line wired with network devices is provided with wireless terminals enabled to exchange packets with wired side via said wireless interconnecting device, wherein said wireless interconnecting device is the wireless interconnecting device having the VLAN function according to claim 33[[27]], wherein in a case where the received packet is the untagged packet and broadcast, transferring of the packet to which the VLAN identifier obtained based upon the destination IP address of the packet is attached is executed when whether or not a wireless terminal belonging to the same subnetwork as the subnetwork to which said destination IP address belongs exists in said administrative information is judged and the wireless terminal is judged to exist in said administrative information, by obtaining the VLAN identifier of the wireless terminal from said administrative information and attaching the obtained VLAN identifier to the untagged packet.~~

35. (Currently Amended) ~~A—The wireless VLAN system comprising a wireless interconnecting device, in which a LAN backbone line wired with network devices is provided with wireless terminals enabled to exchange packets with wired side via said wireless interconnecting device, wherein said wireless interconnecting device is the wireless interconnecting device having the VLAN function according to claim 34[[28]], wherein in a case where the received packet is the untagged packet and broadcast, transferring of the packet to which the VLAN identifier obtained based upon the destination IP address of the packet is attached is executed when a wireless terminal belonging to the same subnetwork as the subnetwork to which the destination IP address belongs is judged not to exist in said administrative information, by obtaining the source MAC address from the untagged packet and then obtaining the VLAN identifier corresponding to the source MAC address from said administrative information and attaching the obtained VLAN identifier to the untagged packet.~~

36-44. (Cancelled)